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AUTHOR	Cook, John T.; Sherman, Laura P.; Brown, J. Larry
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ABSTRACT

The Food Stamp Program (FSP) is the nation's primary nutrition assistance program for poor families in the United States. This study compared the dietary adequacy of children in poor families receiving food stamps to that of children in poor families not receiving such assistance. Data used were obtained from the 1986 United States Department of Agriculture Continuing Survey of Food Intakes by Individuals, a nationally representative sample survey consisting of an overall sample from all households in the 48 contiguous states, and a low-income sample emphasizing households with incomes below 125 percent of the federal poverty thresholds. This analysis focuses on the low-income sample. The findings indicated that compared to nonparticipating poor children ages 1 to 5, the dietary intake of children whose households received food stamps was significantly better in 10 of 16 major nutrients analyzed. The findings indicate that the Food Stamp Program is highly effective in improving the nutritional status of children in poor families. (Contains 22 references.) (KB)

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Impact Of Food Stamps On The Dietary Adequacy Of Poor Children

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John T. Cook
Laura P. Sherman
J. Larry Brown

Center on Hunger, Poverty and Nutrition Policy
Tufts University School of Nutrition

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Helen Jensen, Associate Professor of Economics, Head, Food and Nutrition Policy Division, Center for Agricultural and Rural Development, Iowa State University

Beatrice Rogers, Professor of Economics and Food Policy, Dean for Academic Affairs, Tufts University School of Nutrition

David Rush, Professor of Nutrition and Community Health, Head of Epidemiology Program, USDA Human Nutrition Research Center on Aging, Tufts University School of Nutrition

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FOREWORD

This analysis of federal government data reveals that the Food Stamp Program significantly improves the nutrient adequacy of poor children. Compared to nonparticipating poor children ages one to five, the diets of children whose households receive food stamps are significantly better in ten of sixteen major nutrients analyzed. These findings come at a time in which an emerging body of scientific evidence reveals that children are far more susceptible to inadequate dietary intake than previously appreciated.

As Washington policymakers debate important issues, it is important to recognize that proposed "reforms" may have serious and even unintended consequences. At a time when millions of America's poor children are the victims of hunger, for example, it is not a good idea to weaken the Food Stamp Program, the most important child nutrition program which supplements their meager dietary intakes.

Recently, physicians from every state in the nation advised Congress that tampering with food stamps, infant feeding programs, and school meals is medically unwise. This advice, from deans of medical schools and officers of the American Academy of Pediatrics, is professional opinion based on sound research evidence.

The data released in this new analysis provide further evidence that many children already exposed to developmental damage associated with hunger could be subjected to even greater harm if their families are not protected by food stamps. To weaken the very program which has the capability of helping them is scientifically insupportable.

Irwin H. Rosenberg, M.D.
Jean Mayer Professor and Dean for Nutrition Sciences
Tufts University School of Nutrition

INTRODUCTION

The results of this analysis indicate that food stamps significantly improve the nutrient intakes of poor children. Low-income children ages one to five years are far more likely to be deficient in major nutrients when their families do not receive food stamps.

Comparisons of the adequacy of nutrient intakes of poor recipient children with nonrecipient children, based on government data, are summarized in Table 1. These results show that the Food Stamp Program significantly improves the nutritional status of poor children.

This study is the second of a two-part series by the Center on nutritional deprivation among low-income children. The first, released May 1995, was titled "Differences in Nutrient Adequacy Among Poor and Non-Poor Children," and utilized data sources and analytical methods similar to those used herein.

METHOD OF ANALYSIS AND DATA SOURCE

Comparing families receiving food stamps with those who do not, this analysis shows the proportion of young children with intakes of major nutrients below 70 percent of established Recommended Dietary Allowances (RDAs). Tests of the significance of differences between the proportions of food stamp recipient and nonrecipient children were made using chi-square statistics.[1] Results, including level of significance and percentage difference in the proportions of children deficient on each nutrient, are presented in Table 1.

Data used for the comparisons in this analysis are from the 1986 USDA Continuing Survey of Food Intakes by Individuals. This nationally representative sample survey consists of an overall sample from all households in the forty-eight contiguous states, and a low-income sample emphasizing households with incomes below 125 percent of the federal poverty thresholds. Since this analysis is concerned primarily with poor children, data were used from the low-income sample.[2]

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[1] For detailed description of the chi-square statistic and its application see, for example, Fienberg, S. E. (1985), The Analysis of Cross-Classified Categorical Data, MIT Press, Cambridge, MA, 1985.

[2] The data can be found in "Nationwide Food Consumption Survey, Continuing Survey of Food Intakes by Individuals, Low-Income Women 19-50 Years and Their Children 1-5 Years, 4 Days," Tables 6a-6h (NFCS, CSFII Report No. 86-4, issued January 1989 by USDA/HNIS, Nutrition Monitoring Division).

BACKGROUND

The Food Stamp Program (FSP) is the nation's primary nutrition assistance program for poor families. The program provides coupons (food stamps) to eligible households which can be used for the purchase of specified food items. In 1994, an average of 11.1 million households and 27.5 million persons participated in the FSP each month (USDA, 1994). Children comprise 50 percent of FSP participants, and fifteen percent of all FSP households contain elderly people. Three quarters of these elderly FSP households consist of a single elderly person (U.S. Bureau of Census, 1994).[3]

Under the jurisdiction of the House and Senate Agriculture Committees and managed by the U.S. Department of Agriculture, the FSP began initially as a pilot program in 1961, and was established as a permanent program in 1964. Uniform eligibility standards were established in 1971 and the program was expanded to operate in all counties of participating states in 1974. The FSP was reauthorized by the Food Stamp Act of 1977, which also eliminated the requirement for households to pay a portion of the value of food stamp coupons issued out of their own resources. The program has been reauthorized by Congress periodically since 1977.[4]

Previous research has shown that families receiving food stamps spend more on food purchases, and buy food with higher nutrient content, than families receiving comparable amounts of cash benefits. The question of whether food stamp recipients actually have significantly better intakes of nutrients critical to healthy growth and development than nonrecipients is another consideration, however.[5]

The results summarized in this report provide empirical evidence that poor children whose families receive food stamps do have significantly better nutrient intakes than poor children whose families do not receive food stamps. For most major nutrients, the proportion of poor children with serious dietary deficiencies is lowered significantly when their households receive food stamps.

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[3] For more detailed information on several aspects of the FSP see the Appendix to this report.

[4] For additional information on the history of the enabling legislation, including regulations governing operation of the program see the reports produced by Mathematica Policy Research, Inc. and Abt Associates, Inc. listed in the references to this report.

[5] For a review of empirical research on the effects of food stamps on food consumption see Fraker (1992), cited in the references.

RESULTS AND IMPLICATIONS

As indicated in Table 1, nutrient intakes for children receiving food stamps are better on 15 of 16 major nutrients than are intakes for nonrecipients. Statistical tests show that for ten of these nutrients the proportions of food stamp recipient children with deficient intakes are significantly lower than the proportions of nonrecipient children.

For three nutrients (protein, riboflavin, and vitamin B12) the proportions of children with inadequate intakes are 72-100 percent lower among FSP participants. For two other nutrients (folate and magnesium), the proportions of children receiving food stamps who have substandard intakes are over 50 percent lower than for those not in the FSP, while for three nutrients (food energy - calories, calcium, and vitamin B6) the proportions of food stamp recipient children with inadequate intakes is more than 30 percent lower.

This analysis shows that poor children in families receiving food stamps are significantly better nourished than poor children in families that do not receive food stamps. The results indicate that the Food Stamp Program is highly effective in improving the nutritional status of children in poor families.

These results are particularly interesting in light of emerging evidence that even mild-to-moderate undernutrition in young children can lead to long-term and irreparable impairment in cognitive development and academic achievement (Pollitt, 1994). Educational achievement and attainment of skills are crucial elements of successful preparation for the roles of productive adults.

TABLE 1: PROTECTIVE IMPACT OF FOOD STAMPS FOR POOR CHILDREN

Proportion of Poor Children Ages 1-5 with Nutrient Intakes
Below 70 Percent of the Recommended Dietary Allowances;
Food Stamp Recipients Compared to Nonrecipients,
with Percentage Reductions Attributable to Food Stamps

Nutrient	Poor Children Not Receiving Food Stamps (% Deficient)	Poor Children Receiving Food Stamps (% Deficient)	Reductions In Deficiencies Among Recipient Children (% Reduction)
Food Energy *	16.7%	11.4%	31.7%
Calcium **	21.7%	14.3%	34.1%
Folate **	11.5%	5.4%	53.0%
Iron *	41.7%	34.0%	18.5%
Magnesium **	11.7%	5.6%	52.1%
Niacin	3.5%	1.4%	NA
Phosphorus	6.4%	4.5%	NA
Protein *	1.2%	0.0%	100.0%
Riboflavin *	2.3%	0.5%	78.3%
Thiamin	0.6%	0.5%	NA
Vitamin A	9.8%	7.7%	NA
Vitamin B6 *	12.5%	7.6%	39.2%
Vitamin B12 **	4.4%	1.2%	72.3%
Vitamin C	6.3%	7.3%	NA
Vitamin E	33.4%	28.1%	NA
Zinc **	46.9%	34.4%	26.6%

* Differences significant at a level between 0.10 and 0.05.
** Differences significant at the 0.05 level or better.
Source: Center on Hunger, Poverty and Nutrition Policy based on data from the CSFII; Low-Income Women 19-50 Years and Their Children 1-5 Years, 4 Days, 1986, Tables 6a-6h.
NA: Calculations were not performed since differences were not significant.

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DESCRIPTION OF NUTRIENTS AND THEIR IMPORTANCE FOR DEVELOPMENT

Food Energy

Food energy (measured by overall caloric intake) is stored in the liver as glycogen and is required for all life processes, including maintenance of body temperature, muscle movement, and growth and repair of bones and tissues. Unlike the RDAs for other nutrients which are set above observed average intake levels, the RDAs for food energy are set *at* the observed average of the intake levels for various sub-populations. Thus children with food energy intakes below 70 percent of the RDAs consume fewer calories than are consumed on average by about *three-fourths* of the people of comparable age and gender.[6]

The small size of children's livers, relative to total body mass, necessitates that they eat more frequently than adults to ensure adequate supplies of food energy for normal activity, learning and functioning. Whitney & Rolfes (1993, p. 520) note, for example, that "a child's liver can store only about four hours' worth of glycogen - hence the need to eat fairly often." Inadequate food energy intake can cause problems with attention, concentration, learning, and other important daily activities. For children who do not eat breakfast, the educational value of a morning in the classroom may be lost. Repeated episodes of inadequate food energy intake can lead to cumulative deficits in learning, lower academic achievement, higher rates of school failure, and even cognitive impairment (Center on Hunger, Poverty and Nutrition Policy, 1995; Pollitt, 1994).

Micronutrients, Vitamins and Minerals

The National Academy of Sciences sets RDAs above the observed average population intakes for the fifteen other nutrients examined in this study (rather than at the mean, as is the case for food energy) to provide a "safe nutritional margin" for most people. Therefore, as Senauer (1991, p. 222) points out, "the proportion receiving less than 70% of the RDA is a better indicator of potential nutrition problems than the average or mean percent of the RDA consumed for a nutrient."

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[6] Since the RDAs for food energy are set at the observed population mean intake levels for each age-gender subgroup, 70 percent of the RDAs is approximately two-thirds of one standard deviation below the mean. Since the mean of a normal distribution plus or minus one standard deviation unit comprises approximately 68 percent of the distribution, 70 percent of the RDAs is an intake level above which approximately three-fourths of the distribution falls.

In the following paragraphs the roles of the nutrients are described for which significant differences were found in this analysis, along with primary food sources, and potential results of deficiencies. As these paragraphs indicate, adequate nutrient intakes are critical to maintain sound health and prevent disease. Children with intakes of key nutrients below 70 percent of RDAs are at greater risk of health problems, are less likely to succeed in school, and are more likely to require costly interventions and support as they grow older (Center on Hunger, Poverty and Nutrition Policy, 1995; Sizer and Whitney, 1994; Karp, 1993; Pollitt, 1994).

Calcium

Calcium, the most abundant mineral in the body, is stored in bones where it provides an integral part of bone structure and is released to body fluids when the blood calcium concentration declines. Calcium is essential for proper bone and teeth formation and for maintenance of bone strength. Though only about 1.0 percent of the body's calcium is in the fluids that bathe and fill cells, this small amount is critical for nerve transmission, maintenance of normal blood pressure, muscle contraction (including heartbeat), secretion of hormones, digestive enzymes and neurotransmitters, integrity of cell membranes, and blood clotting.

Food sources of calcium include dairy products, oysters, small fish prepared with their bones such as sardines, broccoli and dark green leafy vegetables, tofu, stone-ground or self-rising flours, blackstrap molasses and calcium-fortified foods.

Calcium deficiencies during childhood and periods of rapid growth can prevent achievement of maximum peak bone mass and density. Among children this condition can manifest as stunted growth. Too little calcium deposited in the skeleton during childhood and young adulthood can lead to osteoporosis (adult bone loss which significantly increases susceptibility to fractures) in adulthood (Sizer and Whitney, 1994).

Data from national food and nutrient consumption surveys indicate that low calcium intake among children is associated with lower family income levels (DHHS and USDA, 1989). Calcium intake is considered by the National Nutrition Monitoring System to be a current health issue, due to the high prevalence rates and severity of osteoporosis caused by inadequate calcium intake during rapid growth periods of childhood and adolescence (DHHS and USDA, 1989, p. 66).

Folate

Folate is required by the body for the production of red blood cells and genetic material. Deficiencies of folate can cause anemia, weakness and forgetfulness.

Food sources of folate include dark green leafy vegetables, fruits, meat and grain products.

Research has shown that even mild folate deficiency reduces the capacity of immune cells to kill infection. Folate deficiency also causes similar mental symptoms as anemia, tiredness, apathy, weakness, forgetfulness, mild depression, irritability, headache, disorientation, confusion, and inability to perform simple calculations (Hamilton, Whitney and Sizer, 1994).

Iron

The human body needs iron to form red blood cells and to fight infections. Iron is also important in avoiding and treating lead toxicity.

Food sources of iron include red meat, chicken, fish, grains, eggs, beans, and dark green leafy vegetables. Vitamin C also aids in the body's absorption of iron

A person deficient in iron can experience reduced productivity, fatigue and increased distractibility. Iron deficiency in children can lead to reduced learning ability and impaired cognitive development (Pollitt, 1994).

According to data from the U.S. Department of Labor's Consumer Expenditure Survey for 1988 and 1989, average annual expenditures for meats, poultry, fish and eggs by households from the highest two income quintiles combined (the top 40 percent of households) were 64-69 percent higher than for the bottom two quintiles combined (the lowest 40 percent of households).

Magnesium

The primary functions of magnesium are in muscle contraction, maintenance of healthy teeth, and building proteins.

Food sources of magnesium include whole-grain products, most dark green vegetables, and milk.

When magnesium deficiency occurs, a person experiences weakness or confusion, and in children growth failure can occur. "Dietary levels of magnesium appeared to be positively associated with economic status. Households with higher income per capita reported using food providing more magnesium per person than did lower income households" (Nutrition Monitoring in the U.S., 1986, pp. 159-160).

Protein

Proteins are complex molecules composed of chains of nitrogen-containing amino acids. Some proteins are active, or working proteins, while others form structure. Among the working proteins are enzymes, antibodies, transport vehicles, hormones, cellular "pumps," and oxygen carriers. Structural proteins include tendons and ligaments, scars, the cores of bones and teeth, hair filaments, components of nails, and more.

A constant supply of amino acids is necessary to build proteins needed to support growth and maintenance of the body. Proteins are involved in replacement of worn-out cells, repair of damaged cells and tissues, creation of enzymes and hormones, and building and functioning of antibodies. The latter are critical to normal functioning of the body's immune system which enables it to resist and respond to disease.

Proteins also help regulate the quantity of fluids within various parts of the body, maintain fluid and electrolyte balance, and regulate the acid-base balance within the blood by acting as buffers. In addition to these functions, proteins can be converted into energy when other energy sources are not available (Sizer and Whitney, 1994, pp. 180-194).

Food sources of protein include meat, fish, poultry, dairy products, eggs, legumes, nuts and grains. Some foods contain incomplete proteins, which lack certain essential amino acids. When eaten together, some foods with incomplete proteins can lead to mutual supplementation as the amino acids in each make up for those lacking in the other. This process is called protein complementarity. The body's effectiveness in using any particular protein depends on overall health, the protein's digestibility, the nutrients eaten with the protein, and its amino acid content.

Protein deficiencies can result from trauma, illness, or insufficient food intake. Inappropriate nitrogen balance for age and growth status can emerge due to insufficient protein intake. Dietary protein deficiency and energy deficiency nearly always occur together, and are known as protein-energy malnutrition (PEM). The most widespread form of malnutrition in the world today, PEM is prevalent in Africa, Central America, South America, and the Near East. It also appears, though less frequently, in U.S. inner cities, rural areas, Indian reservations, and in other areas where hunger and food insecurity exist. In its most extreme forms, PEM manifests as marasmus -- seen as generally stunted, shriveled and excessively lean appearance, and kwashiorkor -- accompanied by a swollen belly and skin rash (Sizer and Whitney, 1994, p. 200).

Using data from the Pediatric Nutrition Surveillance System (PNSS) and the Nationwide Health and Nutrition Examination Survey (NHANES) II, Yip, et al. (1993) found significantly higher prevalence of shortness or stunting among low-income American children compared to non-low-income children. These findings are consistent with the existence of PEM among very-low-income children in the U.S. Protein intakes have been found to be higher among persons with higher incomes (USDA/HHS, 1989, p. 51).

Riboflavin

Formerly called vitamin B2, riboflavin is a water-soluble B vitamin which plays a role in energy metabolism in all cells. Riboflavin is a component of enzymes involved in release of energy from protein, fats and carbohydrates.

Food sources of riboflavin include dairy products, grain products, meat, poultry and fish, green leafy vegetables and mushrooms.

Riboflavin deficiency is often accompanied by thiamin and niacin deficiencies. Clinical signs of riboflavin deficiency include cracks at the corners of the mouth and soreness or inflammation of the mouth, lips and tongue.

Mean intake levels of riboflavin have been shown to increase with higher income levels (USDA/HHS, 1994, p. 59).

Vitamin B6

Vitamin B6 is critical for red blood cell production, and aids in various kinds of cell reactions.

Food sources for vitamin B6 include meat, chicken, fish, bananas and nuts.

Vitamin B6 deficiency causes weakness and irritability. Advanced symptoms include growth failure. "Households with higher income per capita reported using food providing more vitamin B6 per person than did lower income households" (Nutrition Monitoring in the U.S., 1986, p. 127).

Vitamin B12

Vitamin B12 is needed for formation of red blood cells, synthesis of genetic material, proper functioning of the nervous system, and metabolism of protein and fat.

Food sources for vitamin B12 are primarily animal products, though some forms of nutritional yeast also contain appreciable amounts. Principal sources in the American diet include meat, poultry, fish and dairy products.

Vitamin B12 deficiency can lead to pernicious anemia characterized by the presence of large, immature red blood cells. Severe and prolonged cases of vitamin B12 deficiency can lead to damaged nerve sheaths, creeping paralysis, and general malfunctioning of nerves and muscles (USDA/HHS, 1994, p. 61; Sizer and Whitney, 1994, pp. 233-5).

Zinc

Zinc assists in the immune functions of white blood cells, in blood clotting, and in growth and development. Zinc also affects behavior, learning and task performance.

Zinc is found in relatively expensive foods, such as shellfish, meat, chicken, cheese, and nuts.

Research has shown that even mild zinc deficiency can result in impaired immune response, night blindness, and mental lethargy (Whitney and Rolfes, 1993, p. 420). Both iron and zinc deficiencies are associated with growth retardation. Like iron, zinc is displaced by ingested lead, or lead absorbed from the environment. Thus, maintenance of adequate levels of zinc in the body is also important in preventing the systemic damage caused by lead toxicity in children.

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APPENDIX

KEY DATA ON THE FOOD STAMP PROGRAM

OVERVIEW

The Food Stamp Program is the nation's first line of defense against hunger. Begun as a pilot program in 1961, it was established as a permanent program in 1964. The fundamental mission of the program is to help low-income people buy food to supplement and improve their diets. Half of all food stamp participants are children, and nearly two-thirds of recipients are children, the elderly, or disabled.

The Food Stamp Program is also an important source of food for the nation's working poor. More than 20 percent of food stamp households have earnings from jobs, and many more are temporarily unemployed.

The program is administered nationally by the U.S. Department of Agriculture, and on the state and local level by human service agencies. The federal government pays the full costs of issuing food stamps and at least half of the program's administrative costs, with state and local governments paying the remainder. The program is under the jurisdiction of the House and Senate Agriculture Committees at the federal level.

ELIGIBILITY

The Food Stamp Program operates as an entitlement -- any needy household meeting the eligibility requirements is entitled to receive food stamps. Uniform eligibility standards were established in 1971, and expanded to operate in all counties of participating states in 1974. The requirement that recipients pay part of the value of coupons issued was eliminated by the Food Stamp Act of 1977.

Any U.S. resident has the right to apply for food stamps, with eligibility status determined via an application process. This process includes filling out an application form, being interviewed, and verifying certain information. Applicants are required to verify their identity, citizenship or immigrant status, income and assets, and the validity of any deductions claimed. All able-bodied members of an applicant's household between 18 and 60 years of age who do not qualify for exemption (as well as heads of households aged 16-17) must register to work. Many adult participants are required to take part in employment and training programs.

To receive food stamps, all households (excluding those with elderly or disabled members) must have *gross* incomes below 130 percent of the poverty threshold. All households must have *net* incomes below 100 percent of the poverty threshold. Net income is gross income less all deductions allowed under the program.

NUTRITION AND HEALTH IMPACTS

* Department of Agriculture studies show that food stamps lead to significantly greater expenditures on food, and greater nutrient availability in participating households.

* Estimates of the nutritional content of food purchased with food stamps range from 3-9 times higher than for food purchased with cash.

* Significantly smaller proportions of poor children in food stamp families are nutrient deficient compared to poor children who do not receive food stamps.

* For 10 of the 16 nutrients examined, the proportion of children in food stamp families with inadequate intakes is significantly smaller than for children in poor families not receiving food stamps.

* The incidence of low birthweight is significantly lower among very poor women (incomes under 50 percent of poverty) who are food stamp program participants versus nonparticipants.

PARTICIPANT PROFILE

* Families with children receive about 81 percent of total benefits provided by the Food Stamp Program

* Children (under age 18) comprise 50 percent of all participants

* Elderly and disabled persons comprise 11.5 percent of all participants, and receive about 13 percent of all FSP benefits

* About 56 percent of benefits go to households with incomes below half the poverty line

* Average length of participation in the Food Stamp Program is 18 months

* Over half of all participating households leave the program after seven months

BENEFIT LEVELS

Benefit levels are based on the cost of the USDA Thrifty Food Plan for each family, the lowest cost of a minimally nutritious diet for the family.

* Average benefit level received in FY 1994:
  - -- $69.36 per person per month
  - -- $0.76 per person per meal
* Maximum benefit level that could have been received in December, 1994 according to the Thrifty Food Plan:
  - -- $84.18 per person per month
  - -- $1.00 per person per meal
* 81 percent of all FSP households receive less than the maximum benefit allotment; one third receive half the maximum allotment or less.

PROGRAM PARTICIPATION

* Average monthly Food Stamp Program participation in 1994:
  - -- 11.09 million households
  - -- 27.47 million individuals
* Participation rates (the proportion of persons eligible who are actually participating in the program):
  - -- Overall: 59.1 percent
  - -- Children: 68.0 percent

PROGRAM COSTS

* Total Food Stamp Program costs were $24.48 billion for FY 1994
  - -- This represents 1.65 percent of total FY 1994 federal budget outlays
  - -- Total federal budget outlays, for all purposes, including military expenditures, were $1,483.8 billion in FY 1994

About the Center

The Center on Hunger, Poverty and Nutrition Policy was established at Tufts University in 1990. Its purpose is to advance public policy choices which reduce hunger and poverty, and enhance the development and productive capacities of American families and children. The Center carries out policy research and analyses, and works with governmental leaders and the media to promote greater understanding of policy alternatives for the nation.

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Tufts University
11 Curtis Avenue
Medford, Massachusetts 02155
Phone: 617/627-3956
Fax: 617/627-3020

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